

# Climate-driven Mosquito Population Modeling

Cory Morin

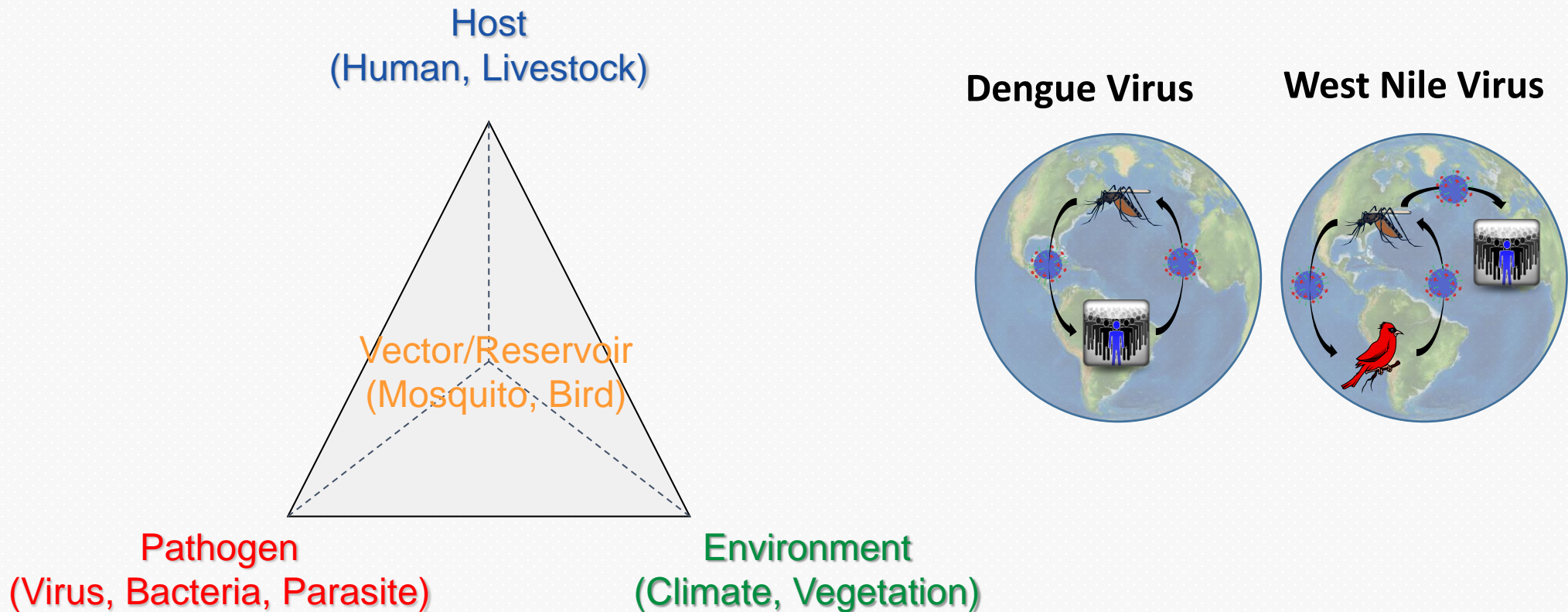
NASA Postdoctoral Program Fellow

[cory.morin@nasa.gov](mailto:cory.morin@nasa.gov)

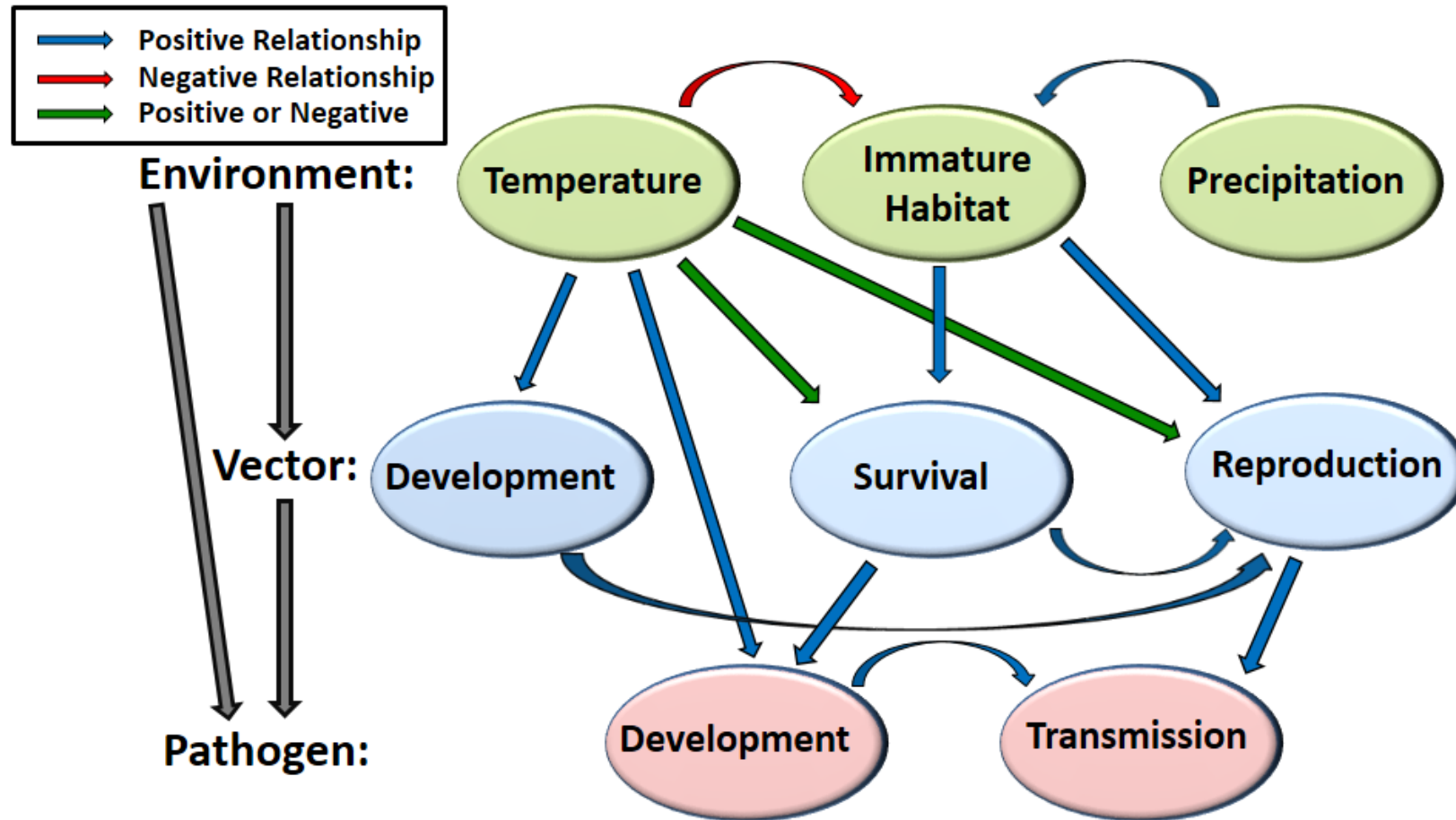


# Infectious Disease Ecology

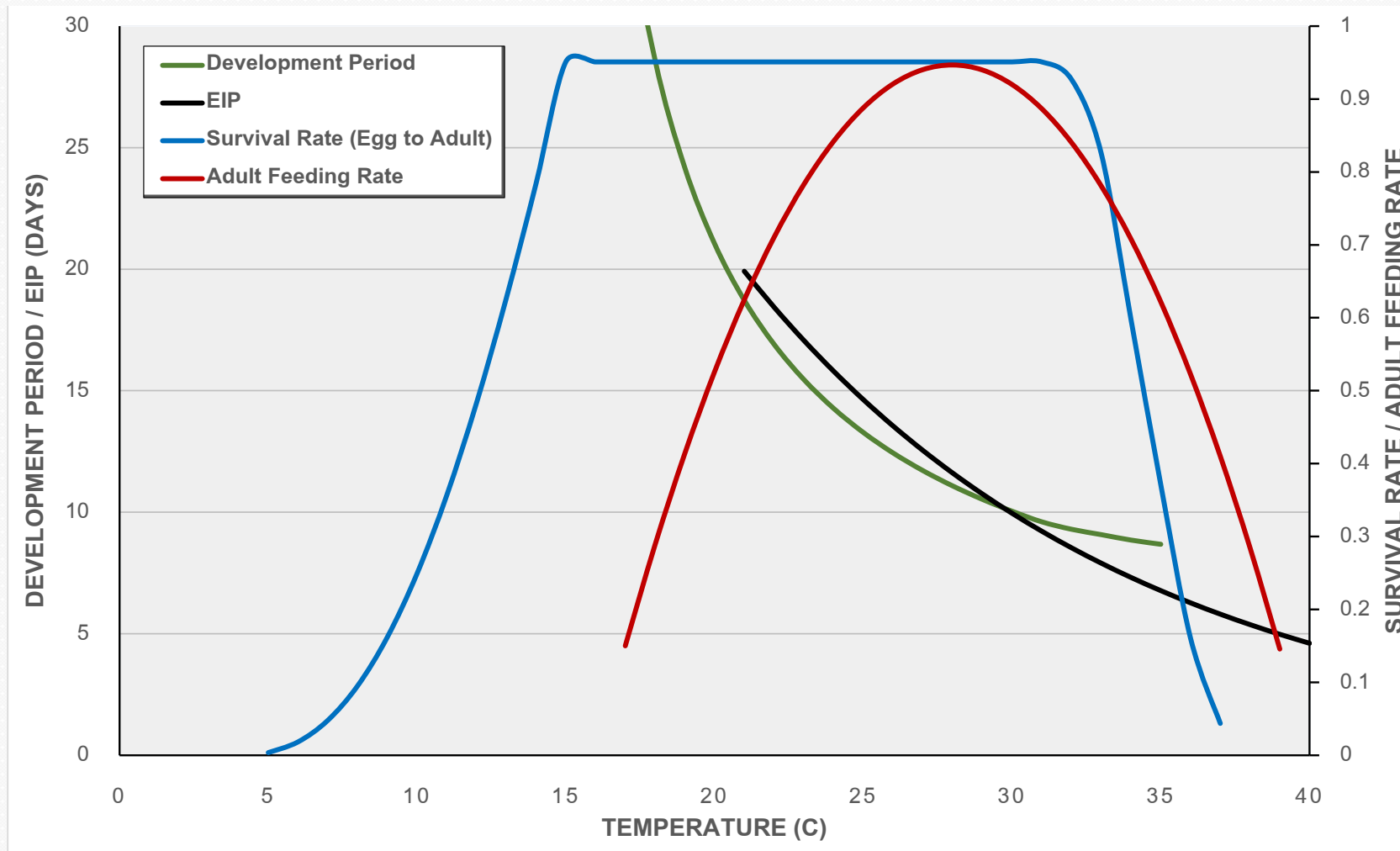
*A multi-factorial relationship between hosts, agents, environment, and vector*



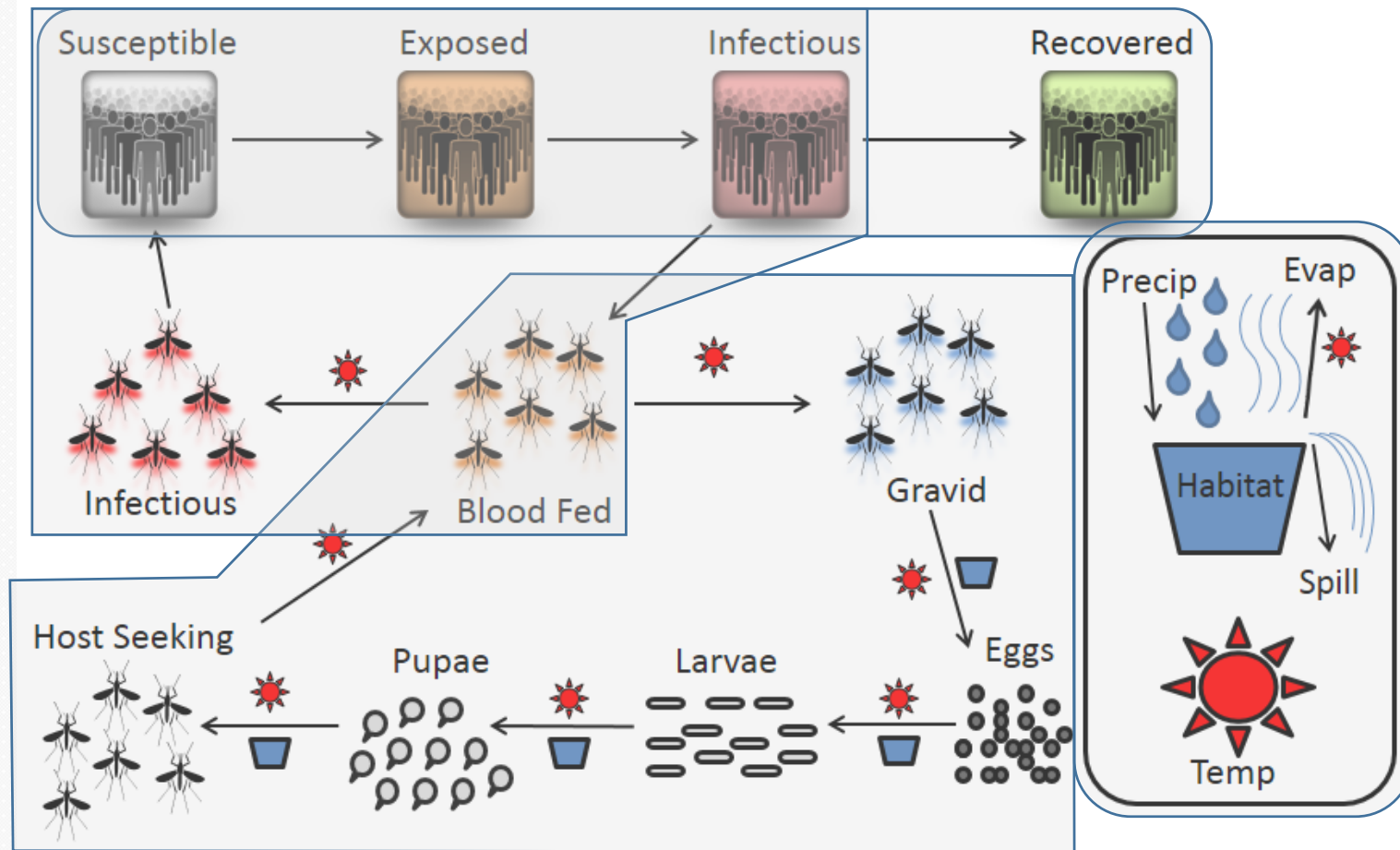
# Weather/Climate Influences on Vector-borne Disease Ecology



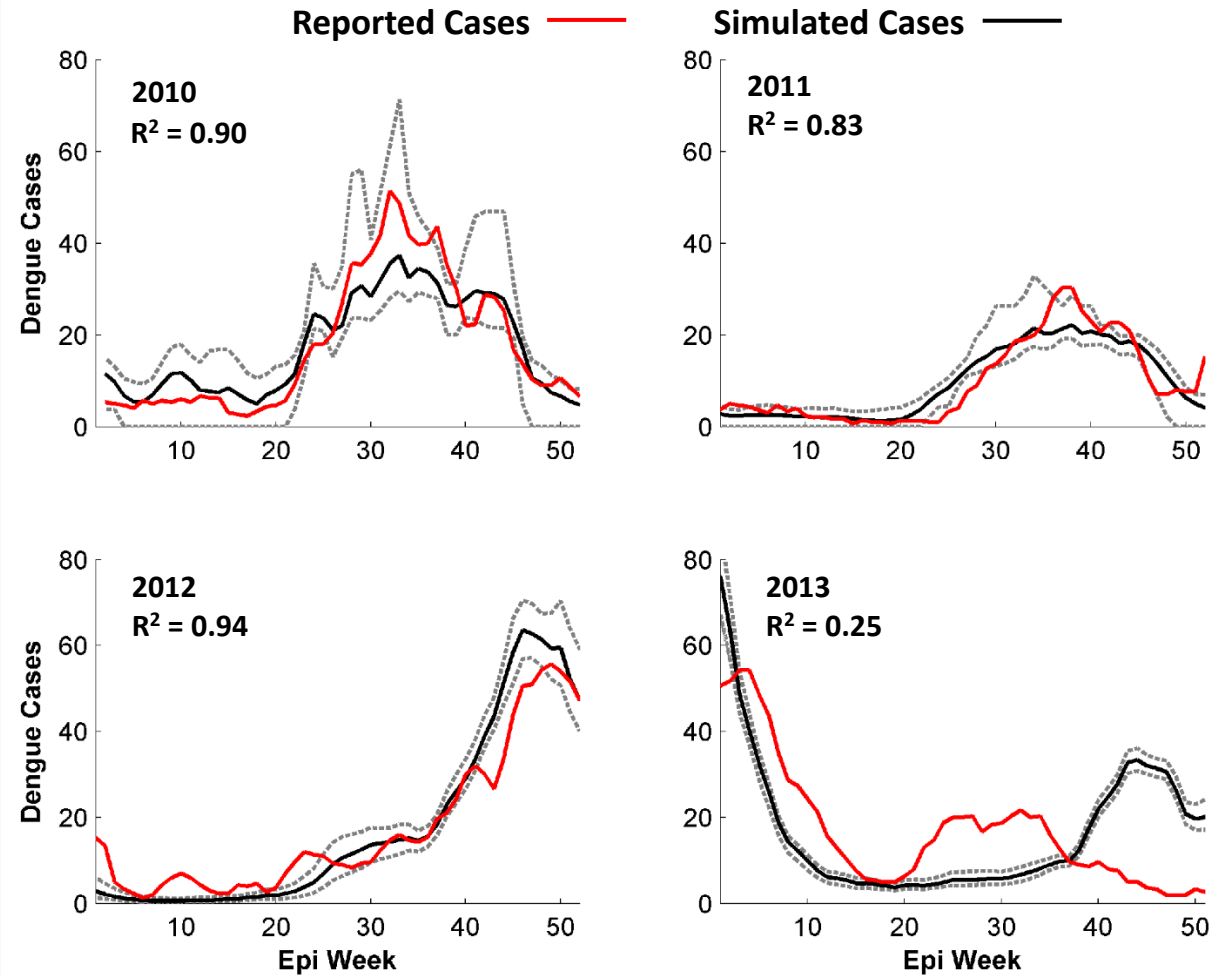
# Temperature Relationships



# Modeling *Aedes aegypti* and Dengue Virus Ecology

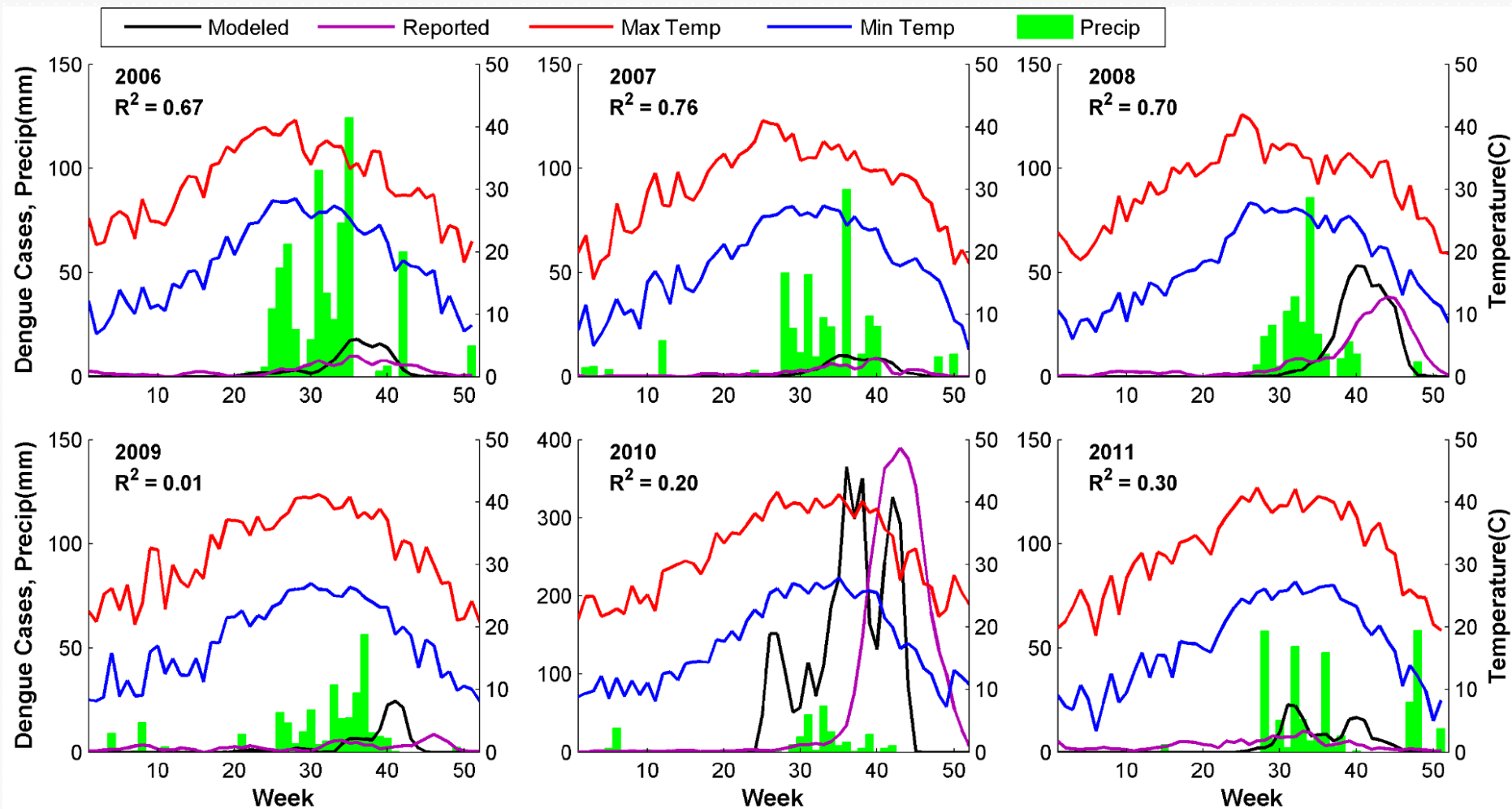


# Example Results (San Juan, PR)



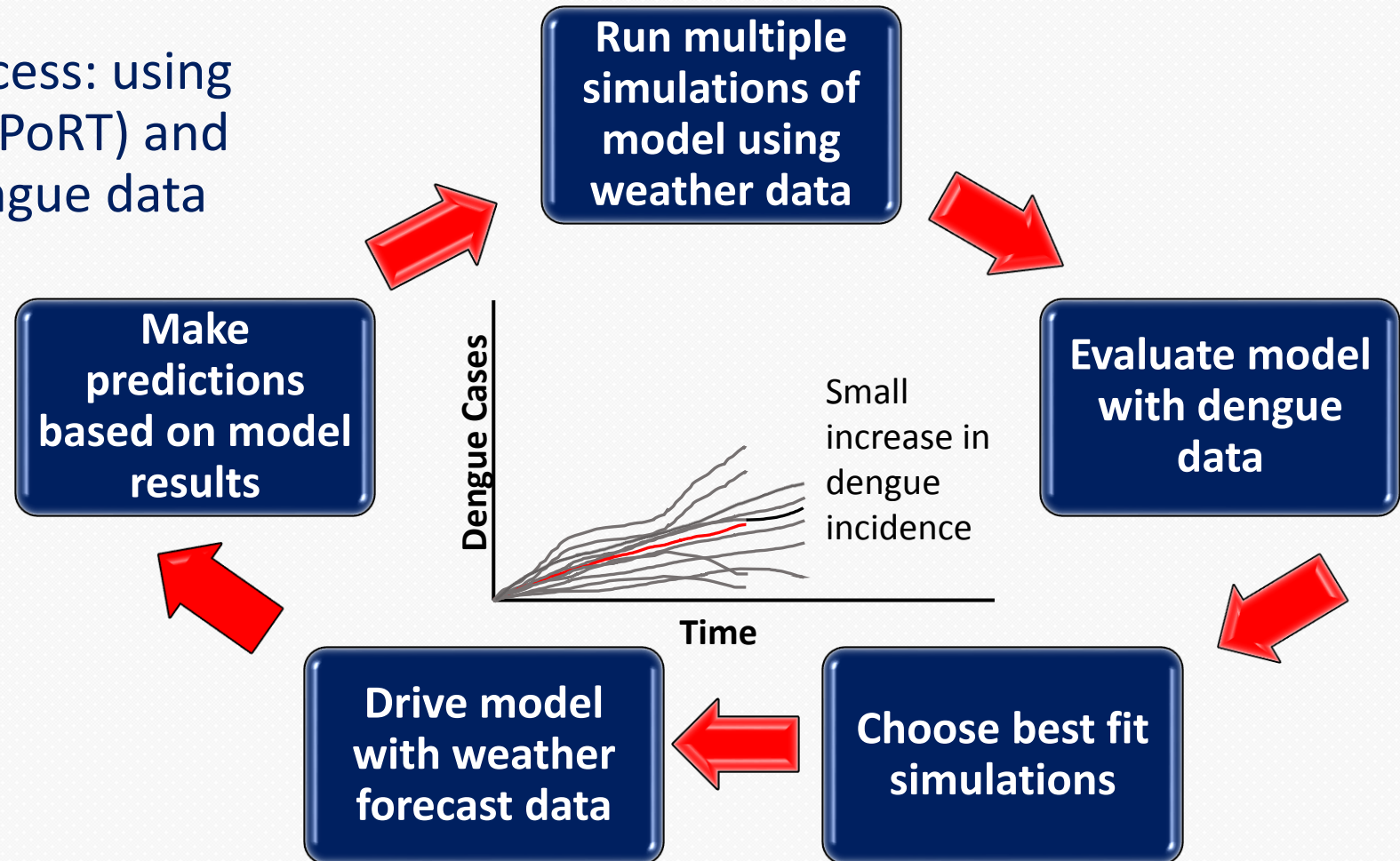


# Example Results (Hermosillo, MX)



# Forecasting Techniques

- Iterative weekly process: using weather forecasts (SPoRT) and weekly reported dengue data





# Challenges and Opportunities for Forecasting Vector-borne Disease Risk

- Knowledge gaps

- Vector population dynamics
- Extrinsic Incubation Period (EIP)
- Transmission probabilities

- Vector-Disease

- Misdiagnosis
- Subclinical cases
- Availability of data

- Environmental data

- Availability/Reliability
- Resolution
- Predictability

- Surveillance Data

- Model parameterization
- Model evaluation
- Data integration

- Expertise

- Behavioral risk factors
- Demographic risk factors
- GIS and mapping

- Environmental data

- Observations



# Thank You for Your Attention

## Questions?

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